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ABSTRACT

Reported is an analysis of teacher self-assessment and related student perception of the instructional behavior among 208 students in grades 7-9 and their 26 science teachers. The teacher sample was a group participating in a Cooperative College-School Science Teacher Improvement Project. Each teacher was required to randomly identify four students in one of his classes to form the experimental group and select a non-project fellow teacher who also identified four students for a control group. Using the one-group pretest-posttest design, teacher self-assessment was made with the Science Classroom Activities Checklist (Teacher's Perception). In a pretest-posttest control design, data relative to students' views were gathered by the student perception form of the Checklist. Results obtained showed the presence of a significant change in teacher's perception of science instruction. Student mean gains were found to be greater for project teachers, and their observations were in agreement with perceptions held by their teachers. Teacher perceptual changes had carryover value into classroom strategies. (CC)

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AN ANALYSIS OF TEACHER SELF-ASSESSMENT AND RELATED STUDENT PERCEPTIONS REGARDING INSTRUCTIONAL BEHAVIOR OF JUNIOR HIGH SCHOOL SCIENCE TEACHERS

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INTRODUCTION

During the past decade much emphasis and financial support have been forthcoming for various teacher improvement projects. Important to the success of these projects is the nature of the classroom activities which the teachers utilizes after being trained in one or more of these curriculum improvement programs. Research by Flanders (1963), Kochendorfer (1966), Blosser and Love (1969) and Sagness (1970) has indicated that the nature of the classroom activities used in science instruction is important to any instructional program and is also an important result as an outcome in any teacher training effort.

PROBLEM OF THE STUDY

The problem of this study was to determine the effect of a six-weeks training program on Junior High School science teachers classroom activities and the carryover value of these effects into their classrooms.

To evaluate the nature of the science classroom activities employed by these teachers in their instructional mode, the Science Classroom Activities Checklist (teacher's perception and student's perception) was utilized. This instrument was developed and validated by Sagness (1970. The instrument consisted of sixty (60) items which were grouped into seven (7) subscales. The subscales include the following:

(a) Student classroom participation
(b) Role of the teacher in the classroom
(c) Use of textbook and reference materials
(d) Design and use of tests
(e) Laboratory preparation
(f) Type of laboratory activities
(g) Laboratory follow-up activities

The following hypotheses were investigated: $H_{(1)}$: after participating in the training program, project teachers will not change their perceptions significantly about the types of science classroom activities which are used for science instruction, $H_{(2)}$: classroom performance of project teachers will not change significantly when regard to the types of science classroom activities which are used for science instruction, and $H_{(3)}$: no significant difference will be noted between teacher perceptual changes and student reported observations of teacher changes used in their science instruction.

PROCEDURE AND DESIGN

The six-weeks teacher training period was conducted during the summer quarter, 1971. The training components were as follows:

(a) Two weeks Life Science (IMB)
(b) Two weeks Earth Science (ESCP)
(c) Two weeks Physical Science (IPS)
(d) Four field trips
(e) Classroom Interaction Analysis (Flanders System)
(f) Microteaching and teaching skill area (Asking Questions)
(g) Module development

In addition to the summer phase, each participant attended nine (9) monthly all-day workshop sessions during the academic year (1972).

Junior High School science teachers (N = 26) who participated in the training sessions represented six (6) county and city school systems in middle Georgia. There were 13 male and 13 female participants representing the following grade levels: seventh grade (9), eighth grade (8), and ninth grade (9). The research design for the teacher sample, identified by Campbell and Stanley (1963) as the one-group Pretest-Posttest, is shown below:

$$O_1 \times O_2$$

A correlated t-test was used to analyze data relative to the teacher sample.

To evaluate the carryover effect produced in the teacher training sessions, each of the teachers was asked to randomly identify four (4) students in one of his science classes for Pretesting and Posttesting. This sample (N = 104) of students was the experimental group. Additionally, each teacher participant was asked to identify a fellow teacher (same grade level and subject) who would use the same procedure to identify four (4) students for a control group (N = 104).

The research design for the student sample, identified by Campbell and Stanley (1963) as the Pretest-Posttest control group is shown below:

$$\text{R-E } O_1 \text{ X } O_2$$

$$\text{R-C } O_3 \quad O_4$$

Gain scores were computed between Pretest-Posttest for each group and a t-test calculated between experimental and control groups.

As a measure of agreement between teachers and students of teachers regarding science classroom activities, a "z" score was calculated between proportional successful responses for each group on Posttest data.

TABLE 1

TEACHER DATA

N = 26

DESCRIPTION	SUB SCALE	PRE		POST		t VALUE
		$\bar{X}$	S.D.	$\bar{X}$	S.D.	
Total Test		45.6	6.6	51.0	4.2	6.02***
Student Classroom Participation	A	6.6	1.4	7.4	0.7	3.33**
Role of the Teacher in the Classroom	B	7.2	1.4	7.5	1.5	0.76
Use of Textbook and Reference Materials	C	6.2	1.3	6.7	1.0	2.62*
Design and Use of Tests	D	7.3	1.2	9.0	1.3	6.47***
Laboratory Preparation	E	6.0	1.2	6.7	0.7	3.14**
Types of Laboratory Activities	F	5.9	2.3	7.6	1.4	5.16***
Laboratory Follow-Up Activities	G	5.7	1.1	6.5	0.6	4.39***
KR_{20} Reliability		0.85		0.71		

* Significant @ .05 Level
** Significant @ .01 Level
*** Significant @ .001 Level

STUDENT DATA

S.O.T. (N = 104)
S.N.O.T. (N = 104)

DESCRIPTION	SUB-SCALE	S.O.T. PRE $\bar{X}$	S.O.T. PRE S.D.	S.O.T. POST $\bar{X}$	S.O.T. POST S.D.	S.O.T. $\bar{X}$ DIFF.	S.N.O.T. PRE $\bar{X}$	S.N.O.T. PRE S.D.	S.N.O.T. POST $\bar{X}$	S.N.O.T. POST S.D.	S.N.O.T. $\bar{X}$ DIFF.	t-Value ($\bar{X}$-Diff.)
Total Test (60)		34.8	6.0	39.6	6.0	4.8	33.0	5.4	36.0	4.6	3.0	2.74 **
Student Classroom Participation (8)	A	4.6	1.4	5.6	1.7	1.0	4.3	1.4	4.9	1.8	0.6	2.65 **
Roll of the Teacher in the Classroom (9)	B	5.8	1.4	6.4	1.8	0.6	5.4	1.4	5.9	1.7	0.5	0.81
Use of Textbook and Reference Material (8)	C	4.9	1.4	5.4	1.4	0.5	4.9	1.4	5.2	1.4	0.3	1.85
Design and Use of Tests (11)	D	5.6	1.9	6.5	2.5	0.9	5.5	1.9	5.8	2.8	0.3	2.77 **
Laboratory Preparation (8)	E	4.8	1.3	5.5	1.4	0.7	4.6	1.3	5.0	1.5	0.4	2.30 *
Types of Laboratory Activities (9)	F	4.9	1.5	5.7	1.9	0.8	4.7	1.6	4.9	1.9	0.2	2.81 **
Laboratory Follow-up Activities (7)	G	3.9	1.5	4.6	1.6	0.7	3.8	1.7	4.3	1.6	0.5	2.28 *
KR_{20} Reliability		0.67		0.90			0.69		0.88			

* Significant @.05 Level
** Significant @.01 Level

TABLE 3
(Post Data)

Analysis of Teachers and Students of

Teachers Proportional Responses

Description	Sub Scales	P	Q	z Values	Significant Levels
Total Test		0.78	0.22	1.54	NS
Student Classroom Participation	A	0.84	0.16	1.36	NS
Role of the Teacher in the Classroom	B	0.77	0.23	1.17	NS
Use of Textbook and Reference Materials	C	0.76	0.24	1.60	NS
Design and Use of Tests	D	0.71	0.29	2.31	0.05
Laboratory Preparation	E	0.68	0.32	1.26	NS
Types of Laboratory Activities	F	0.74	0.26	2.21	0.05
Laboratory follow-up Activities	G	0.79	0.21	1.24	NS

SUMMARY OF FINDINGS

Hypothesis One was rejected at the 0.001 level of confidence (Table 1). Teachers showed a significant change in their perception of science instruction for the total sixty (60) item checklist. Six (6) of the seven (7) subscales indicated positive mean gains.

Hypothesis Two was rejected at the 0.01 level of confidence (Table 2). Students Pretest-Posttest mean gain scores were greater for project teachers than for students of non-project teachers. Significant mean gains in five (5) of the seven (7) subscales were in favor of students instructed by project teachers.

Hypothesis Three was not rejected for the total sixty (60) item checklist post data regarding project teachers perception of classroom activities and students of project teachers observations of classroom activities (Table 3). Subscales D and F did show significant differences at the 0.05 level of confidence.

CONCLUSIONS

Objectives of the research project were to determine the effect of a six-weeks training program on teacher perceptions regarding classroom activities, evaluate the carryover influence of these teacher perceptions into their classroom teaching and to evaluate the agreement between teacher perception--practice and student observations of these practices.

Data analyses indicated that the training did produce a perceptual change in this sample of teachers and this change did have carryover value into their classroom strategies. Additionally, students observations of these classroom activities were in agreement with perceptions held by their teachers.

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